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Tree Pruning.

TREES can still be pruned to advantage up to the time, now rapidly approaching, when the limbs are gorged with sap, so that they will bleed more plentifully than at other seasons. This loss of fluids does not operate to weaken the vitality of a tree to any serious extent, but as the sap runs down the bark and keeps it wet for a long time, besides preventing the adhesion of any coating over the raw surface, the spores of various rot fungi are apt to find a lodgment in the wound so that decay will set in. This loss of sap will make comparatively little difference in the case of small limbs, and it should not prevent the prompt removal of stem and root sprouts, for example, so that these will not continue to exhaust the energies of the tree another season. As a rule, late autumn is the best season for the general pruning of ornamental trees, because the leaves are then out of the way and the branches which cross and rub against each other can be detected. When the whole skeleton is made bare it is more easy to see which branch it is that projects in such a way as to make an unsymmetrical head and where the limbs are growing too thickly.

Of course, no one should be allowed to use a knife or a saw on a tree unless he knows exactly what he wants to accomplish by pruning and can tell why the operation will bring about the desired end. Some tree lovers are so sentimental that they look upon any pruning whatever as a species of cruelty. Others believe that every effort to make a tree shapely is unnatural, and therefore inartistic. But it can be easily demonstrated to the first class that, instead of inflicting an injury, the good pruner can add to the vigor and longevity of a tree, especially of one which for any reason has begun to show signs of feebleness. To the other class it may be said that the effort to keep the tree shapely and in its proper natural balance by pruning is quite a different operation from clipping it into a form unlike what it ever would assume if naturally grown. It is small wonder that persons who watch a gang of professional tree-trimmers moving their equipment of ladders and axes from one tree to another along a city street shudder at the butchery they witness. These impostors often saw off every large limb a few feet from the trunk and leave only an occasional stub projecting from the remnants of these limbs, so that what was once a tree becomes a mutilated stump, and the very process which was intended to make it healthy and beautiful ruins it beyond any hope of recovery. Of course, street trees need pruning, but if they have been well selected at the outset a small knife will suffice to remove while they are young an occasional branch which starts from the wrong place, and if they are carefully attended to for some years rarely will any large branches need to be removed. While on the subject of shaping trees it may be remarked that on a broad lawn single trees never look as well as when their branches sweep the turf, and in most instances it is a barbarity to cut these away. Coniferous trees which grow in a pyramidal form, unless they are closely crowded in a wood, always branch close to the ground, and the removal of these lower limbs not only converts a beautiful tree into an unsightly object, but it almost certainly injures the health of such species as naturally grow in moist climates, for these low branches not only check evaporation from the soil and retain moisture about the roots of the tree, but they help to bring the centre of gravity of the mass nearer the base, and in this way enable the tree to better withstand the force of the wind.

We began this article, however, for the special purpose of calling attention to the fact that pruning can be used as a remedial or restoring process upon deciduous trees which have become decrepit. There is nothing new in this, and in the very first volume of this journal, and often since then, we have explained how trees which have begun to show signs of enfeebling age can have their youthful vigor renewed. When the upper branches of a tree begin to die, this means that for some cause the tree is receiving insufficient nourishment. When the ground has been pastured over and trampled upon, the food taken away by grass or crops and the tree neglected in every way, there is nothing that will so stimulate new life as vigorous surgery. More is needed than the cutting away of branches already dead. A tree on the decline should have its main branches all shortened in from one-third to one-half their length. What is needed is more leaf-surface, because the vital work of the tree is carried on in the leaves, where the plant food taken up by the roots and from the air is elaborated and transformed into growing tissue. These feeble branches carry nothing but small and scattered leaves which do not suffice to carry on the life-work of the tree with energy. But when a branch is cut away the tree at once exerts itself to throw out new shoots, and these shoots will bear much larger leaves, so that the leaf-surface of the tree will be greatly enlarged, while the amount of wood to be vitalized is decreased. Of course, such trees can be helped in other ways—that is, by covering the ground with ashes or well-rotted manure, or by giving in any other way a supply of food that is easily assimilated, but the pruning is the energizing factor in the process. Every one has noticed how vigorously a shoot will start from the root of a young Oak which is cut to the ground, and how the leaves will expand to accommodate themselves to the greater work imposed upon them, and prepare to utilize all the sap the roots will furnish. It is this same principle which will stimulate an old tree when its branches are pruned hard back to throw out new shoots and clothe them with abundant foliage.

We almost hesitate about repeating such an elementary injunction as that a branch should be cut off close beyond a healthy lateral, and yet it is a rule that we see violated every day, not only in ornamental plantations, but even in orchards. This lateral branch in spring will throw out a great number of leaves which supply themselves with sap which they can digest and send back to the very extremity of the amputated limb. If this extremity is painted over with coal-tar, or any other thick paint laid on with a brush, the wound will begin to heal over at once. On the con-

trary, if the amputated stump is left, so that the sap does not circulate to its extremity, it will necessarily die back to the point where the sap ceases to flow. This simple fact was illustrated in the first volume of this journal on page 349, with cuts taken from "A Treatise on Pruning Forest and Ornamental Trees," translated from the French of Monsieur A. des Car, and published in 1881 by the Massachusetts Society for Promoting Agriculture. A little reflection will show any one that as the living trunk or branch grows and envelops what is merely a dead plug, the tree will inevitably decay to the centre, for, as the rot fungus destroys the lifeless wood, water will soak in and carry these elements of decay deeper and deeper until the tree is hollowed out and finally made worthless.

All our native forest-trees take kindly to this treatment, and it was nine years ago when we wrote that most of them could be rejuvenated in this way. We then explained that decrepit Red, Black, White and Swamp Oaks, Black Birches, Beeches, Hickories and Elms had been thus pruned in the Arnold Arboretum where the trees in the natural woods were perishing from pasturage and from neglect. They were covered with dead branches, the foliage upon them was thin and poor, their dying tops showed that they had but a short space to live. It seemed important to save many of these old trees until a growth of self-sown seedlings could be brought on to replace them and a covering grown for the forest floor, and as some of these old trees were pruned each year those which had been operated upon first, or some six or seven years earlier, already showed in their dense dark-colored leaves and compact growth that pruning alone without any fresh soil or fertilizing material could put new life into a tree that was feeble and dying. Subsequent experience has confirmed the usefulness of this practice, and we can repeat our counsel with confidence, and advise all persons who have deciduous trees which have begun to fail to undertake the renewal of their vigor by intelligent surgery.

The Chemise World.

OF all Californian shrubs or trees, the Chemise brush or Chemisal, Adenostoma fascicularis, gives most character to the landscapes of the Coast Ranges. What the Heaths are to western Europe, Chemisal is to California, and vast tracts of poor mountain lands are covered with thickets composed almost entirely of this one shrub.

Outside of the timber belt, which begins at Monterey and extends at intervals to Oregon, there is scarcely a mountain on the Coast Range of California, from San Diego on the south to Trinity, almost at the Oregon line, which is not in part covered by it. The greater the distance from the ocean the larger the percentage of mountain lands which this hardy shrub has taken possession of, until many sections of the eastern part of the Coast Ranges are almost entirely given up to it, and from the valleys to the mountain tops it holds a sway only shared by a few of the hardiest shrubs, Oaks and conifers. Many millions of acres of Government lands, which look so inviting on the maps, are but Chemise patches, and, as now, will always be a no-man's land, harboring only the deer and the coyote. Hardly a spot is too steep to allow it a foothold, hardly a soil too meager to afford it sustenance. Fires sweep over and leave blackened stubs, but with its unusual vitality it soon starts a new growth. In a few years rocks, hills and slopes are again masked by a close cover of blue-green which gives to the mountains a softness of outline peculiar to the Coast Ranges, and very beautiful, too, although the monotony of flowing lines often becomes tiresome.

Ukiah Valley is hemmed on the eastern side by a long, even-topped range of mountains. On the map they bear the Indian name of Mayacamas, being one of the numberless short ranges which form the jumble known as the Coast Range. The Mayacamas divide the chain of valleys, once lakes, of which Ukiah valley is one, from another chain of lakes which are now slowly undergoing the same process of extinction. The largest of these is Clear Lake, a beautiful body of water, mountain-hemmed, thirty-five miles long, with a maximum width of eight miles. Next to Ukiah valley the range rises first in rolling foothills, which give way to steep grassy slopes interspersed with Oak woods, or occasional Chemise-covered barren mounds. Above the Oaks the upper range is to be seen as an endless succession of round-topped knolls or smooth slopes, all Chemise-covered, with the sky-line seldom broken by fringe of distant rock or tree mass.

If a more intimate knowledge of the high Chemise world is desired, access is not difficult. Many trails or wood roads lead through the Oak woods and the open ranges, and traveling is not difficult on foot or on horseback. Halfway up the mountains the Chemise is entered, and the hills which from the valley seemed covered with a smooth low coat are found to be tangles of dense brush from four to eight feet high, except where a fire has recently burned. Travel in the Chemise is of necessity pretty closely confined to the trails which have been made along the ridges by deer, Indians or hunters, and even on these trails it is not always easy. But let the hunter stray from the trail and he is apt soon to find himself in a thicket so impenetrable that he can neither force his way through nor crawl under, and it does not take a long experience in attempting to pull himself over the tops to convince him that the trail is the only satisfactory place for travel.

So year after year the Chemise grows, and by the not infrequent winter snows is pressed down more compactly, until some day a hunter, wishing to drive out the game or make for himself an easier passage, drops a match in the tinder underneath, and a fire is started which rolls over the hills in sheets of flames, making the grandest of pyrotechnical displays for the valley dwellers. Creeping among the dead leaves in thinner brush, it burns swathes for miles and finally dies out only when fuel is exhausted, it may be in days or weeks. Where the brush has been thick and the wind favorable only short stubs are left, but as often as not the leaves and twigs are burned and the stout stems remain a chevaux-de-frise almost as hard to penetrate as the original thicket, and even more destructive of good temper and clothes.

A favorite trail into the great expanse of Chemise between here and Clear Lake leads along the main ridge which divides the waters flowing into Russian River from those which, flowing at first into Clear Lake, finally find their way into the Sacramento River. This route, closely hemmed for miles by brush, gives constantly changing views of the beautiful Ukiah valley to the west, and of other valleys connecting with it on the north and the south. All about and to the east is a far wilder scene. For mile after mile, slope after slope, hill after hill, far-stretching ranges bear the same covering of Chemisal, and in the general view scarcely a shrub, tree or mass of rock rises above the lonesomely monotonous mass, except for infrequent groves of the straight and symmetrical west coast Scrub Pine, Pinus attenuata, on prominent points. Near at hand encircling ranges form a large basin which in turn is filled with a confused medley of lower ridges and hills. Rising head and shoulders above the wild Chemise region to the north and west, high snow-covered mountains can be seen, Pine forests ascending far up their slopes. The great dome to the north-east is Snow Mountain. In the middle rises Pine Mountain, a mass of conifers to its summit, while to the north the long ridge of San Hedrin can be seen. The long expanse of wild country is only broken by a tiny vale in the basin below. Among these thousands of acres of wilderness, perhaps forty acres form a rich little valley, watered by mountain springs and giving a good homestead to a mountaineer. Like an oasis in a desert, it intensifies by contrast the loneliness of the surroundings. Desolate and barren it may seem, but I have found this wild region peculiarly rich in beautiful spots, and its inaccessibility shelters many a beautiful flower. Pretty little

valleys are hidden in the most unsuspected places, and the freshly burned-over Chemise is a rich field for the plant hunter.

A typical Chemise valley lies just north of Red Mountain, on which is the curious grove of Cupressus Macnabiana described in a previous number of GARDEN AND FOREST (see vol. ix., p. 233). Lost Valley is well named, for come upon it from which direction you may, it is a surprise. Two vales wind in sinuous curves through dense brush, and coming together form a broader vale containing a swamp of four or five acres. The little valley is closely hemmed by a dense growth of Chemise and Scrub Oaks, but not one intrudes into its grassy limits. Situated at about two thousand feet altitude, its climate is cool, and its growing season is at its height when in the valley below the dry summer has begun. Frosts come frequently and at all seasons, but the vegetation seems to have peculiar powers of withstanding them. Short Bunch Grass grows over the drier portions, and the swamp is a tangle of immense Thistles and Water Grasses, mingled in the fall with Golden-rod. Swamp plants follow the little watercourses. In July, Lilium pardalinum may be seen lifting its scarlet and yellow flowers above the weeds, and in late June handsome pale blue Camassia flowers in abundance throughout the wetter part of the place. Indeed, bulbous plants would quite possess the valley were they not kept in check by the gophers, whose underground passages are everywhere that the water permits. In June a blue Brodiæa grows in great abundance, and a little later Calochortus lilacinus, dwarfed as befits its high home, lifts its pretty lilac cups among the grass-blades. The tiny dwarfed plants and little cups of C. venustus, var. oculatus, which as the valley dries up are to be seen in the high portions, are little like the grand blossoms of the same plant in the valley below, and the rich purple tints seem unnatural. As little to be recognized are the small flowers and short leaves of the high mountain form of Iris macrosiphon, which is quite plentiful in the gritty soil next the side of the vale.

Nature is rich in oddities here. Down in the swamp a great Thistle grows; its woolly stems rise five or six feet high. The same plant grows in the higher parts of Lost Valley in a dwarfed form, the white leaves scarcely rising above the ground and the thick head set close down in them. The whole plant is more like a Cactus than the lofty plant of the swamp. Two Godetias abound in the late spring. G. viminea also grows below in the valley. It is one of our showiest plants, a lovely slender-stemmed annual, the flower having a red centre. The other Godetia has a pale, rather inconspicuous flower; it has a tendency to form round mats with many stems. All about the edge of the valley the soil is dry and gritty, and there can be seen large beds of our common St. John's-wort, a species with short stems six inches high and a very pretty yellow flower. It is one of the hardiest of flowers and thrives in the little dry openings throughout the Chemise country. We have few more delicately beautiful flowers. Sysyrinchium bellum is not uncommon.

I well remember a lovely lateral vale which I happened upon a few years ago. A fire had deadened the brush and invigorated the Columbines of the Aquilegia truncata type. There were hundreds of plants in full blossom, and so thick as to exclude all other species. This five-spurred flower is always beautiful, but I have never seen it to such advantage since nor before. In May the common Buttercup, Ranunculus macranthus, tinged the vale with yellow. Later there are many composites, and even in the fall the succession of bloom is kept up in the swamp and about the spring.

Four years ago the finest wood of Pinus attenuata I have ever seen stood on the slopes of the hill at the head of the valley, clean, symmetrical and straight-limbed, and as thick as the trees could well grow. A fire swept through, and now only bare trunks are left. With them, however, death is the beginning of a new and more abundant life. The fire that destroys the parents releases from their long imprisonment in the cones the abundant seeds, which, falling in the still warm ashes, soon produce a more abundant growth. Now there are thousands of handsome young trees coming on. I have observed that this Pine is on the increase under prevailing conditions. It fruits at an early age, and fires seldom find it unprepared to perpetuate itself. It is of the hardiest constitution, and the seeds grow vigorously in the most barren of soils. Old trees of P. attenuata, gnarled, encircled by the persistent cones of many years and with dead limbs, can only be said to be picturesque, but many of the younger specimens are truly beautiful.

I suppose that of all of the shrubs of Chemise land, the Chemise itself, Adenostoma fascicularis, comprises fully ninety per cent. of the specimens. On the southern slopes, and on the less precipitous slopes to the west and northwest, it rules almost to the exclusion of all other shrubs. It belongs to the Rose family and is an evergreen with linear Heath-like leaves, a light-colored stringy bark and brittle wood. In late spring it produces an abundance of whitish flowers with green centres, and they are followed by seed-pods concealed by the tawny remains of the flowers which persist till fall. While it is overwhelmingly predominant in its realm, it lives on familiar terms with a great variety of shrubs or dwarfed trees as well fitted as itself to endure the hard conditions. On the driest ridges can be seen a stiff, spiny-looking shrub with small elliptic leaves, thinly distributed and grayish bark. In its season it has short racemes of very fragrant white flowers, which perfume the mountain wastes. This is Ceanothus sorediatus in its high mountain form.

Here and there throughout the Chemise, in single tufts or in copses, the California Holly grows, or, as the Mexicans called it, "Toyon." It is an evergreen with large, glossy, serrated leaves. In midsummer it produces its white flowers and forms its panicled clusters of berries. These gain color as the season advances, and by the midwinter holidays are a glowing wealth of crimson. For a long time the bright masses show against the dark foliage and lighten up the brushy expanse. On the highest ridges, where the summer heat is greatest and the soil the driest, and even the hardy Chemise takes on a stunted form, can be seen another extremely interesting shrub, Pickeringia montana, which is excelled by none of its Leguminous relatives when in full flower. At other times one sees a thin-leaved, stiff and spine-tipped shrub, often but four or five feet high, but sometimes twelve or fifteen. The bark is light green, the leaves ovate-lanceolate. It is very beautiful when the bush is a solid mass of pea-shaped flowers of a soft flesh-pink. Its season is quite long.

Ukiah, Calif. *Carl Purdy.*

Leaf-spot of Pear.

FROM observations made during the past two or three years it has become apparent that what is called "leaf-spot" of the Pear in this country, and generally attributed to the fungus known as Entomosporium maculatum, is not wholly due to this fungus, but in many cases, perhaps the majority, is caused by an entirely different parasite. This emphasizes the need of expert examination of plant diseases when an occasion arises for writing upon these subjects, if one wishes to speak with as much accuracy concerning the name of the plant as would be desired when writing of potatoes. For some time I had been desirous of obtaining this fungus, E. maculatum, on the Pear in the vicinity of Ithaca, for a study of its life-history. And while the fungus on Quince leaves and fruit has always been in considerable quantity here I have never been able to find it on the Pear. A bulletin describing the results of spraying for the Pear leaf-spot in an orchard about two miles from Ithaca suggested to me that I might find the desired fungus here. The orchard was visited early in the spring in order to inspect the dead leaves in the hope of finding, not only the conidial form of the Entomosporium on the leaves which had been lying on the ground

during the winter, but also the perfect stage, both of which stages of the fungus I had found on Quince leaves which had been lying on the ground in an orchard during the winter. Nothing was found, however, which could in any way be considered connected with the Entomosporium. On the other hand, two species of the genus Sphærella were found on the Pear leaves, as follows, Sphærella sentina and S. Pyri.

This led me in the summer of 1895 to look more carefully for the Entomosporium on spotted Pear leaves. The first diseased leaves which came to my notice were on large nursery trees in the horticultural grounds of Cornell University. The older spots furnished various saprophytic fungi like Cladosporium herbarum and pycnidial forms of Pleospora herbarum, but in no case were the spores of the Entomosporium to be found. On the other hand, in the younger spots there was found abundantly a fungus belonging to the genus Septoria, a genus which furnishes many species at whose door is laid many leaf-spots of various plants. Ordinarily the spots on the Pear leaves caused by this Septoria would not be noticed to differ from those caused by the Entomosporium, but careful comparison reveals several points of difference. Many of the spots are slightly larger, and there is a great tendency for the spots to be angular and somewhat elongated in shape, while the spots of Entomosporium are more nearly circular. Upon the under side of the leaf at certain stages there appear minute jet-black points, which do not appear in the spots of Entomosporium. The microscope reveals these black points to be made up of long coiled strings of spores which have oozed out of the pycnidium of the Septoria. The individual spores, which are very long, slender and more or less curved or flexuous, have a light green tinge, while in mass they appear black.

Next the orchard was visited where spraying experiments had been carried on against the Entomosporium, and no trace of this fungus was found. But on several trees the Septoria was present, and in one case the tree was badly blighted, nearly every leaf being affected. Investigations were then made of several large Pear orchards at Geneva, New York, and while both the Septoria and Entomosporium were found on a great many trees, the Septoria was by far in the majority, and in many cases both fungi appeared on the same leaf. Material was also secured from a large number of varieties of Pear-trees in a nursery at Syracuse, and here also the Septoria predominated.

During June, 1896, Mr. B. M. Duggar was appointed on the staff of the Botanical Department as Cryptogamic Botanist of the experiment station here, and the investigation was placed in his charge. His observations have confirmed those of mine concerning the prevalence of the Septoria in the etiology of Pear leaf-spot, the Septoria being more abundant than the Entomosporium. He has been able to obtain a knowledge of a still wider range of the Septoria in this state, and has also received it from a number of other states. He is preparing the matter for a bulletin, and would welcome contributions of Pear leaves supposed to be affected with the Entomosporium from any section of the country, in order that the distribution of the two fungi may be obtained. To those who are interested I would suggest dried material now in the herbarium, the collection of Pear leaves in the early spring which have been on the ground during the winter, and freshly diseased leaves later in the season, and that these be communicated to the department here, since cultures are now in progress to determine the life history of the fungus, and it is desired to obtain and cultivate as many of the species of the genus Sphærella as possible, since species of Septoria have been in some cases connected with species of Sphærella.

Another important fact in connection with the Entomosporium has also come to light during my study of this fungus. This is the discovery in this country of the perfect fungus which Sorauer discovered in Europe in connection with E. Mespili on leaves of Cotoneaster tomentosa and Pirus communis.

Reference has been made above to my discovery of the perfect form on leaves of the Quince which had lain on the ground during the winter. This was in the spring of 1895, and on the same leaves were also spores of the conidial stage of the Entomosporium maculatum. In discussing this Entomosporium in the report of the Department of Agriculture (1888), Professor Scribner cites Sorauer's work on the perfect stage, and reproduces some of the figures, stating that no other observer had at that time confirmed Sorauer's discovery. Aside from the interest and importance attaching to the discovery of this form in the United States on another host, it is of interest to note that Sorauer places the fungus in the genus Stigmatea, which resembles Sphærella in the form of the perithecia and ascospores, but differs in possessing paraphyses and in the context of the perithecia. The fungus seems to me rather to belong to the Discomycetes, and is probably a member of the genus Fabræa. This genus belongs to a family of the Discomycetes in which the fruit body at first is closed, as in the Pyrenomycetes, to which group Stigmatea belongs, but later the fruit body opens in the form of a cup, so that care is needed in observing the later stages of the fruit body to determine its true character. Also in the case of the genus Fabræa, when the plant is dry the margins of the cup-shaped fruit body collapse and fold together, so that it gives the appearance of the closed fruit body of the Pyrenomycetes. On moistening the plant, however, expansion takes place, the margins part, and a broad surface formed by the exposed ends of the asci comes to view.

From the apparent wide distribution of the Septoria and from the very probable confusion with the Entomosporium in the case of some spraying experiments, it would seem that the success which has attended the efforts to combat Pear leaf-spot demonstrates by circumstantial evidence that spraying in the usual way will check the Septoria. In connection with nursery stock, one year's stock will sometimes be affected almost entirely with the Entomosporium, and another year's stock almost entirely with the Septoria. This suggests that in budding nursery stock or in grafting, the buds in such cases have been taken from trees affected either with the Septoria or Entomosporium; in fact, that one of the prolific causes of the appearance of the spot in nurseries may be traced to the buds which already may have the germs of the disease. If this should prove to be true, caution in the selection of budding stock, or in its disinfection before grafting, could be recommended.

Cornell University. *George F. Atkinson.*

Foreign Correspondence.

London Letter.

Anoiganthus Breviflorus.—This south African bulbous plant, valuable for the conservatory in winter, is related to the Sternbergias and Cyrtanthuses, and is as easily managed as a Daffodil. The bulb is ovoid, two inches long; the leaves are strap-shaped, erect, about a foot long, deciduous, new ones being developed along with the flowers. These are produced in umbels on erect scapes a foot long, strong plants having ten or a dozen flowers in the umbel. They are tubular, between one and two inches long, at first erect, afterward more or less drooping, their color a bright Daffodil-yellow. In the Cape-house at Kew there are some fine examples of this plant in flower; they are mixed with a group of white-flowered Freesias. During the summer the Anoiganthus is grown in a sunny frame, and after the leaves die off in autumn they are kept dry till the flower-scapes begin to appear. They prefer a rich loamy soil, with plenty of water while in growth. The genus is monotypic. It was introduced from Natal about eight years ago.

Kniphofia primulina.—This is a new species which Mr. Baker has described from plants now flowering in the temperate house at Kew, where it has been an attraction for the past month or so. It has the general characters of Kniphofia Natalensis, but the leaves are three feet long and an inch broad; the scape is three feet high, bearing a dense

raceme of flowers six inches long; the flowers are more than an inch long, tubular, the segments scarcely spreading, and the stamens are about half as long again as the tube. The color of the flowers is bright primrose-yellow. Kew is indebted to Herr Max Leichtlin for this plant, who sent it in 1894 with the information that it was from Natal and that it flowered in winter. When it first flowered it was thought to be a pale form of K. Natalensis. Grown in pots to flower in the greenhouse in winter it is a useful decorative plant, or it may be grown in the open ground and lifted in October, to be planted under glass.

Fig. 10.—Hoodia Gordoni.—See page 76.

CYPRIPEDIUM.—In the December number of *The Orchid Review*, Mr. Rolfe published a revision of Cypripedieæ which is likely to meet with the disapproval of those who object to interference with well-established plant names except for very strong reasons. It appears that Professor Pfitzer, of Heidelberg, has thought fit to revive certain obsolete names and to divide the old genus Cypripedium into four. Until now we have recognized two, namely, Cypripedium and Selenipedium, the latter name being applied to all the South American representatives of the tribe. Even this name, however, was not recognized by many, Veitch declining to adopt it in his *Manual of Orchids*. The new arrangement is as follows:

1. Cypripedium proper is to be limited to the terrestrial deciduous species represented by C. spectabile, C. Japonicum, C. calceolus, etc.

2. Paphiopedium is the proposed name for all the Old

World species not included in 1; these are represented by C. insigne, C. Stonei, C. niveum, etc. These were the Eucypripedia of Bentham & Hooker.

3. Selenipedium. This name is to be limited to several South American species, none of which have ever been introduced. Examples, S. Chica and S. palmifolium.

4. Phragmopedium is the name proposed for all the cultivated plants hitherto known as Selenipediums. These are all natives of South America; examples, P. longifolium, P. candatum, P. Schlimii.

Whatever cultivators may think of this new arrangement, botanists, including Sir Joseph Hooker, are of opinion that it is justifiable. Apart from the question of convenience, we have the fact that 1, 2 and 4 are well differentiated in habit and behavior under cultivation. They have never been intercrossed, although seedlings have been raised from crosses between 2 and 4, but they have invariably perished before flowering.

Orchids from Seeds.—In my last letter I suggested that choice species and varieties of Orchids should be raised from seeds obtained artificially. I have since been informed that several Orchid breeders in this country have seedlings of such, but I am requested to withhold the names of the plants, lest it might affect the commercial value of the parents. In *The Gardeners' Chronicle* this week there is a note headed "A Scarcity of Orchids," in which attention is called to the scarcity in a wild state of various Cattleyas and other Orchids, due partly to the insatiability of collectors, and partly to the clearing of the land for the cultivation of Coffee. "This Coffee industry in Colombia is extending at the expense of the Orchid forests, for it happens that the Coffee region is exactly the Orchid region." Breeders have succeeded in raising from seeds a large number of species of different genera, including Odontoglossum, Miltonia, Zygopetalum, Cattleya, Dendrobium, Phalænopsis, Phajus, Cypripedium, etc., and there does not appear to be any obstacle to the raising of many other kinds from seeds matured under cultivation. Evidently this is the direction to which we must soon perforce turn for a supply of many Orchids.

London. *W. Watson.*

New or Little-known Plants.

Hoodia.

HOODIA is closely related to Stapelia and was once included in that genus. Four species are known, all natives of hot, dry regions in south Africa. They are remarkable for their many-ridged, spine-clothed fleshy stems, which are more suggestive of Cereus than Stapelia, and also for their large saucer-shaped flowers. These are colored yellowish or reddish brown and are of a disagreeable odor.

If they had not hitherto proved so difficult to keep alive under artificial treatment, Hoodias would certainly be now as well known in gardens as the commonest Stapelias. It is possible that we may yet discover how they ought to be treated so as to keep them healthy; at any rate, plants are now being tried again at Kew. The accompanying illustration (see p. 75) represents a plant flowered by Mr. Armstrong, of Port Elizabeth, to whom Kew is indebted for plants. Hoodia Gordoni was discovered near the Orange River more than a century ago. Fifty years later it was rediscovered by Burke, who was sent by the Earl of Derby to collect plants in south Africa, and he sent home living plants of it which were grown at Knowsley, but they do not appear to have ever flowered there. In 1874 Sir Henry Barkly, Governor of the Cape, obtained two specimens of it, one of which was sent to Kew, where it flowered in 1875, but it died the following year. A figure prepared from this plant by Fitch was published in *The Botanical Magazine*, t. 6228.

The plant has numerous stems in a cluster, suggestive of a Cactus in habit and appearance; they are from a foot to a foot and a half long, two inches in diameter, ridged longitudinally, the ridges clothed with closely set yellow prickles half an inch long. The flowers are produced in clusters of two or three near the apex of the stem; they are rotate, nearly flat, four inches in diameter, the lobes short, or scarcely apparent, abruptly apiculate, yellowish brown flushed with rose, and an eye-like zone of rose surrounding the crimson corona.

A correspondent in Carnarvon, about 300 miles inland from Cape Town, writes: "It may interest you to know that Hoodia Gordoni is very plentiful about here. . . . It grows mostly on the slopes of dolorite-capped hills, and ought to thrive in the moist climate of England, with not more than one watering about every six months. Here it does well with a good rain in March and another in October. It also gets assistance from the heavy dews, as it generally prefers the lower side of a dolorite bowlder from which the lightest rain or heavy dew would run off. I have, however, found numerous plants on a bare flat, and they appeared to thrive as well as the others."

The plant represented here is only a small one, tufts of from twelve to twenty stems being common, and these all flower together, forming a very striking object.

The other species known are Hoodia Barklyi, flowered in the Cape Town Botanic Garden in 1873; H. Bainii, flowered at Kew in 1878 and figured in *The Botanical Magazine*, t. 6348, and H. Currori, which does not appear to have ever been cultivated.

London. *W. Watson.*

Cultural Department.

Lachenalias.

MIDWINTER flowering plants are not, and never will be, too plentiful. This is the one period that taxes the skill of those who have to provide these in quantity, more especially from the end of the Chrysanthemum season until the coming in of Dutch bulbs in spring. Freesias from the Cape of Good Hope are of comparatively recent origin in gardens and fill a place that will never again be vacant, and another valuable set of bulbs, also from the same region, are the Lachenalias. These are very old residents of gardens, since the records show that they were known and cultivated as long ago as 1752, and have since been continuously grown. It does not appear, however, that more than the true species were known, and these remained unimproved down to 1880. At this late date the Rev. John Nelson, an English clergyman, raised the first seedling variety, L. Nelsoni, still perhaps the best of all varieties. More recently still, another clergyman has entered the same field, and to Rev. T. H. Marsh we are indebted for the kinds known as Ruby, Topaz, Little Beauty and Cawston Gem, all of which are distinct gains to gardens. They are, indeed, better than the true species, with the possible exception of L. pendula, which is a giant of its kind.

Most of our winter-flowering plants need an amount of care and preparation during summer that adds largely to their cost, and is not always compensated for by their value when in flower. The popularity of the Freesia among cultivators is largely due to the ease with which it may be stored away in early summer until time for planting in autumn. The same treatment is all that is required for Lachenalias, so that when they are better known they should be more generally grown. Pans, such as other bulbs are grown in, or five-inch pots, should be used, owing to their dwarf habits. The pots are more desirable, owing to their adaptability for general decorative uses. We plant in August in rich soil, and place the pots in a sunny frame until it is no longer frost-proof in early winter. Lachenalias dislike heat and coddling, and the cooler the house, so long as it is free from frost, the better will be the flower-spikes and the foliage. The leaves are attractive and are marked like those of some of the Dogtooth Violets. When the pots are brought into the greenhouse they should, if possible, be placed on a shelf close to the glass, where they can get all the air possible. The flowers will be produced from November until March if a few of the best sorts are grown.

Lachenalias seed freely, come up quickly if the seeds are sown at once, and what is more desirable, perhaps, can be obtained true from seed. This I have heard disputed, but we have them now in bloom without the least variation from the parent variety. While some of the bulbs flower the second year, the majority will take three years to bloom. There is

still a field for the hybridist, all the more enticing that the best kinds now known in gardens are of garden origin. No one seems to have yet taken in hand the crossing of the earlier gigantic L. pendula with the later-flowering kinds. We this season planted a lot of L. pendula late in winter for the express purpose of having it in bloom with L. Nelsoni and L. tricolor, and in this we have succeeded. It only remains to cross them, and we may be able to get an infusion of bright coral-red among the yellows that has not been obtained by earlier operators.

A few notes of varieties best worth growing may be in place here, though it is preferable to procure them in autumn with the other bulbs, or as soon as they can be had from Holland. Lachenalia pendula, before noted, is the first to bloom. Indeed, we use it with the earliest of Roman Hyacinths, with which it is a pleasing contrast in color, while the spikes are equal in vigorous development. The leaves of this species are unspotted, and as large as those of a garden Tulip. There is a variety called Gigantea which we have never yet grown, but hope to next year. L. tricolor, of which there are at least half a dozen varieties, is also one of the best. It is in flower now in best condition, and is useful either in pots or for the flowers when cut. The stems should not be cut, but gently pulled out, as Cyclamen flowers are pulled. This adds length to the stem, and if it is done carefully the bulbs are not injured. L. Nelsoni is the best of all the sorts yet grown. Its color is a bright golden yellow; it increases readily, and is a great advance over its parents, as indeed are the other garden forms already named. It is safe to assume that if these kinds are tried they will be but a beginning, and such species as L. aurea, L. orchioides, L. Cami and L. quadricolor will be added to the set, for all are beautiful and distinct. There are many more species, some of which bear the reputation of being hard to flower in gardens, but with our bright sunny summer days to ripen the bulbs, and the longer growing season in autumn, we ought to have a great advantage over European cultivators.

When one has enough bulbs, there is no prettier way to use them than in baskets. The pendulous spikes show to great advantage in this way, and if moss, with a little bone-meal, is used to grow them in the baskets will not be heavy; a great amount of water or labor will not be necessary. The great secret of cultivating bulbous plants of whatever nature is to take as much care of the plants after they have flowered as when starting them. The bulb is built up for the next year's work after the blooming time, and on this foundation depends all the returns that will be had a year hence. We often hear complaints that Freesias do not bloom well if home-grown bulbs are planted. This depends wholly upon the after treatment that we give them. They should never be disturbed until all signs of growth have disappeared. All the soil should then be shaken off and the bulbs stored in a cool dry place until planting time comes again.

South Lancaster, Mass. *E. O. Orpet.*

Select Dwarf Stove Plants.

PROMINENT among these are the beautiful little Bertolonias. The delicate hues and exquisite markings of their foliage make them both showy and interesting and a welcome addition to any plant collection. It is somewhat difficult to bring out their true characteristics under ordinary stove treatment, as they require a more humid atmosphere than can usually be maintained, even in a small house. The additional shelter of a small frame should be provided where the atmospheric conditions will be much more easily regulated. A plentiful supply of water at the roots is necessary; syringing or sprinkling overhead is not advisable. The most convenient method of propagation is by cuttings, which strike readily in a moderately close propagating case filled with sharp clean sand. The pots should be thoroughly clean and well drained, and the compost open and porous. Bertolonia Van Houttei, B. Legrelli, B. superba, B. marmorata and B. punctatissimum are probably the best varieties found in general cultivation.

The genus Sonerila provides some beautiful species, all of dwarf growth and suited to ordinary stove culture. Sonerila Hendersonii and S. margaritacea are among the best sorts; they require moderate shade and plenty of moisture, and are easily propagated from cuttings. Rough leaf-mold with a plentiful addition of silver sand is a suitable soil for them. The red-veined Fittonia Verschaffeltii and its silvery-veined variety argyroneura are the two forms most commonly grown, and are among the most easily cultivated of dwarf stove plants. They love shade and moisture and grow freely in a compost of equal parts of fibrous loam, leaf-mold and sand. On account of their creeping habit, pans are more suitable for their cultivation than pots. Snails are particularly fond of them, and if not checked will quickly disfigure the plants.

A most attractive little plant is Tapeionites bicolor. The metallic dark green leaves contrast admirably with the pure white flowers; the latter are borne two or three on a stem and rise just above the foliage. T. bicolor thrives best in a peaty soil and is propagated most easily from cuttings. Several of the dwarf forms of Aphelandra may be included in this class. They are beautiful both for their flowers and foliage. The flowers are produced in terminal four-sided spikes. Usually but a few blossoms are open at one time, but a succession of blossoms continues for a considerable length of time. Aphelandra Fascinator, A. pumila and A. Roezlii are three of the best dwarf forms. They may be propagated either from cuttings or seeds, and some of the varieties produce seeds freely. A light fibrous soil is the best. They need plentiful watering during their growing season, but when not in active growth should be kept rather dry. They are generally cultivated in pots, but I have seen them growing and flowering admirably planted out in rock-work.

Higginsia discolor and H. regalis are two lovely dwarf plants. The former grows about six inches high, and the latter to nearly twice that height. Propagated by cuttings they are of easy culture under ordinary stove treatment. The leaves of both species are shining green on the surface and purple-tinted below, H. discolor being the most attractive on account of the rich, satiny gloss of the upper surface.

A neat and almost continuous flowering little plant is Tetranema Mexicana, commonly called the Mexican Foxglove. The flowers are borne in clusters on upright stalks about four inches high. The ground-color is purple, the markings of a light violet color. It produces seeds freely and is easily increased by this means.

Tarrytown, N. Y. *William Scott.*

Stag-horn Ferns.

OWING to the eccentric, but graceful, shapes which their leaves assume, the Platyceriums, or Stag-horn Ferns, as they are commonly called, are plants of prime importance for decoration, and they are specially useful in the stove and greenhouse. The species, seven or eight in number, are widely distributed over tropical and temperate countries, and all of them, with the exception of Platycerium alcicorne and its forms, require a fairly warm house for their perfect development. Being epiphytal in their nature, they can be grown in a variety of ways. P. grande can be grown satisfactorily upon large blocks of wood or upon the dead stems of Tree Ferns, which, if large enough, make ideal abiding places for this plant, and with the addition annually of a little coarse fibrous peat it can be kept in first-rate condition for many years. P. alcicorne also thrives in wire baskets; if it has good porous material for the roots to wander in, the entire surface and sides of the receptacle will soon be covered with foliage. For growing in pots P. Hillii, a recently introduced species, is the most satisfactory, as its habit is more upright than that of the others. When grown in pots it is advisable to break off part of one side and then to place the plant on that side so that the surface of the soil will not be entirely covered up with the sterile leaves, and thus make it troublesome to supply the plant with as much water as it needs. Since a considerable portion of the roots will be found layered between the bases of the sterile leaves, it is a good practice to insert between the leaves a little rough peat and moss to absorb water and hold it as long as possible. Platyceriums will thrive in almost any kind of open well-drained soil, but to have the foliage grow to full dimensions and give the best architectural effect the mixture must be open, so that the roots can penetrate it with perfect freedom, a condition in which they seem to delight. Sphagnum moss, fibrous peat or the coarse root masses of some of the Osmundas, with lumps of charcoal freely interspersed, are substances suitable for older plants. For young pieces rough leaf-mold and chopped moss answer well enough. Old plants of the species which have round sterile leaves are of such a peculiar growth that it is difficult to furnish them with a proper receptacle, but a piece of ordinary wire netting from twenty-four to thirty inches long and about twelve inches wide will answer. The ends of this should be brought together and fastened with wire in the shape of a cylinder. If one end is obstructed so that the roll when in an upright position will hold a coarse root mixture, large pieces can either be fastened to it on one side or all about it, and it can be hung up to the roof of the conservatory. P. Hillii, P. alcicorne and its variety

Majus have more or less round-shaped sterile leaves and nearly upright fertile ones. P. grande, P. Willenckii and P. stemmaria have very ornamental sterile fronds, especially the two former, which are beautifully divided. The fertile ones are drooping and gracefully cut. These Ferns can be propagated by sowing the spores of which old plants give a very plentiful supply, or by the root-buds which develop freely on all the species except P. grande.

Botanic Garden, Washington, D. C. *G. W. Oliver.*

Hardy Cyclamens.

AMONG the interesting plants which emerged from the melting snow last week were some Taurian Cyclamens with beautifully mottled leaves and brightly colored flowers. The Cyclamens have been so much improved in size of flowers and grown under glass so generally that we are apt to forget that many of the numerous species are hardy and very attractive in suitable borders. The hardiness, as in the case of many so-called hardy plants, is comparative, for they will not endure our winters except under certain precautions of planting; but if so established they are fairly reliable, and few small plants are more dainty and attractive. The first requisite to the successful cultivation of Cyclamens of all species is perfect drainage, and this must be arranged for in the borders or there is no chance for success. A good soil is an open sandy one with a trifle of peat, and the best position a raised one where they will have slight shade, possibly under deciduous trees. Limestone is said to be helpful to their growth; broken up old mortar is a good substitute, and will help provide drainage. The Cyclamens are natives of the Mediterranean region from Spain to Syria, and there is at least one African species.

Among the various species flowers may be had at all seasons of the year. Cyclamen Coum, C. Ibericum, C. repandum and C. Persicum flower in January and until May. C. Europæum flowers in summer. C. Neapolitanum, C. Græcum, C. Cilicicum and C. Cyprium from September to December, and C. Africanum in December. The flowers of C. Græcum and C. Neapolitanum appear before the leaves; in the other species they appear together. Of these, C. Africanum, from Algiers, is tender, but is an interesting greenhouse plant, usually having a monster corm six inches or more in diameter. C. Persicum is also tender, and is the parent from which all the modern large-flowered varieties of the greenhouse sorts have been evolved. These are certainly remarkable triumphs of the gardener's skill, but lately they have shown a tendency to further changes in the way of cresting and doubling which will try the temper of the botanist.

The other eight species described by Baker will probably be found hardy in gardens under conditions noted above. If a trial is attempted, perhaps Cyclamen Coum would be the most likely to succeed. My garden is cold, wet and clayey, and these plants do not stay long with me, yet my losses have been, I think, more from careless planting and treatment than from real difficulty in growing the plants.

Elizabeth, N. J. *J. N. Gerard.*

Propagating Chrysanthemums.

CUTTINGS of Chrysanthemums intended for specimen plants may be put in to advantage now. We have started them earlier, but, taking everything into consideration, nothing is gained unless very large plants are desired, and it is a question whether an extremely large plant is evidence of cultural skill. In any event, the feat accomplished, it is no longer considered commendable. The Massachusetts Horticultural Society has wisely, I think, lowered the size limit in pots from twelve to ten inches in diameter.

In selecting cuttings we prefer stout suckers, avoiding those found on the old stems as liable to run to bloom prematurely. No special treatment is required in rooting cuttings; any piece will grow, even a leaf, and leaf-cuttings often make very fine plants. It is the only way to fix a sport. Plenty of water and air is essential, and the mistake of giving too much warmth is the most common one. From the time the cuttings are rooted they must be kept growing steadily. It ruins them to leave them in the cutting-bed when they are once rooted, as they become hardened; such plants often come from the dealers, and they never make specimens. They can be detected at a glance. We take the soft tips and endeavor also to get them to start afresh from the root-stock. Cuttings got in this way are the only ones we can expect to succeed with. We start with four cuttings of a kind, select two to grow, and as exhibition time approaches finish the best one.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

Notes from Wellesley.

To the Editor of Garden and Forest:

Sir,—A day can be profitably spent in making a tour of the greenhouses in and about Wellesley in winter, although the places are seen at their best early in June, when Rhododendrons and Azaleas are in flower, or in October and early November when autumn tints light up the landscape.

In the greenhouses belonging to Wellesley College, the head-gardener, Mr. Butler, generally has something good to show visitors, although his space is somewhat limited and the structures are not of a very modern type. Statice Halfordi, a garden hybrid of S. macrophylla, was represented here ten days ago by some fine plants in full bloom. This Statice, although one of the most handsome decorative plants in cultivation for winter flowering in a cool greenhouse, is by no means common. Acacia pubescens, of which Mr. Butler has two standards, seven to eight feet high, with well-expanded heads, was flowering well. Although it has been in cultivation more than a hundred years, no plant has been found to take the place of A. pubescens when thickly clothed with its racemes of yellow flowers. It is to be regretted that some of our nurseries have not worked up a stock of Acacias in variety. No American firm catalogues them, so far as I know. In addition to A. pubescens, such old but beautiful sorts as A. Drummondii, A. dealbata, A. Riceana, A. lineata and others, which are probably familiar to the oldest plantsmen, should have a place in every establishment where hard-wooded plants are grown. A specimen plant of Dendrobium nobile, which annually produces nearly a thousand blooms, was bristling with buds, and in a few weeks will be a mass of flowers. Angræcum sesquipedale, one of the best of winter-flowering Orchids, was showing its great ivory-white flowers, the sepals and petals spread out like rays six inches across. Odontoglossum crispum and O. triumphans were pushing up stout spikes, and O. pulchellum majus, a healthy little sweet-scented white species, was flowering finely. In a warm house Phalænopsis amabilis and the beautiful white variety, P. grandiflora, were in flower; the leaves of these are tough and leathery, and Mr. Butler says they never fail to flower well. They are grown in a much lighter position than is usually accorded Phalænopsis.

At Mr. H. H. Hunnewell's, the beautiful new Begonia, Gloire de Lorraine, a cross between B. Socotrana and B. Drejei, was covered with clear, rosy carmine flowers. This variety ought to become highly popular when it is sufficiently known; from its habit it promises to be suitable for a basket plant. This species was quite largely grown in England last summer, and it is said to bloom well out-of-doors there. No other Begonia bears flowers of so beautiful a color. Streptosolon Jamesoni, grown as a standard, was effective in one of the cool houses. Mr. Norris holds back as many Orchids as possible to flower during the Rhododendron season, but some good species were in bloom. Lælia anceps was represented in some huge baskets, the plants carrying many spikes. The white forms, L. anceps Sanderiana and L. Schrœderiana, Lælio-Cattleya Pallas and Cattleya Trianæ, were also in flower in the Cattleya-house. In the Orange-house the fine specimen of Clematis indivisa, already figured in Garden and Forest (see vol. vi., p. 167), covers a large portion of the roof, and was in beautiful flower. Cypripedium Harrisianum (barbatum × villosum) was represented by several good specimens. Phalænopsis amabilis, P. Stuartiana, P. Schilleriana and P. grandiflora were all in flower.

At Mrs. B. P. Cheney's beautiful place in South Natick, Mr. John Barr had a magnificent show of Cyclamens. Several hundred of these plants are grown, chiefly in eight and ten inch pots, and one side-stage about one hundred feet in length is entirely devoted to them. Others are being held back in a cold structure. The range of colors, size of flower, foliage and quantity of flowers to the plant were all that could be desired. Mr. Barr usually takes some of the leading honors for these plants at the Boston Spring Show. If he can keep his plants back this year until the third week in March they will not easily be surpassed. Roses, Carnations and all other plants on this place were clean and thrifty-looking. The early grapery was just beginning to break nicely, and the appearance of the canes gave promise of fine bunches.

A visit to Wellesley would not be complete without a call on the veteran florist, Mr. Joseph Tailby, whose compact and well-kept establishment is close to the Boston and Albany Station. Mr. Tailby's specialty, as is well known, is Carnations. Mrs. Fisher is grown largely here and surprisingly well. One large house and part of another are devoted to it. Mr. Tailby still finds it the most profitable variety of the many he

grows. William Scott is the favorite pink variety, and F. Mangold is considered the best crimson. A bed of a promising scarlet seedling, Portia × E. G. Hill, is notable. The flower is a good clear scarlet, larger than either parent, calyx good and stem stiff. There are also some promising crimson seedlings; the old Clove was used as one of the parents, and the seedlings have a delightful clove odor. A house of Violets looked clean and healthy, Marie Louise, Lady Hume Campbell and Swanley White being the double kinds grown, and California the leading single variety. A large number of plants of Crimson Rambler Rose in seven and eight inch pots promise to be in flower by Easter, and also of the new forcing Spiræa astilboides floribunda; the latter is too tall and ungainly to become a popular variety.

A run on the electric cars from Wellesley brings one close to the estate of Mr. David Nevins, at South Framingham. A fine new greenhouse, 105 by 21 feet, has recently been completed here, and Mr. A. McKay already has it well filled. A bench of Violets in eight and ten inch pots makes a remarkably good showing; the plants had been brought in from a cold frame two weeks before, and they were a mass of bloom. I counted thirty-five to forty large perfect flowers hanging around the sides of some of the pots, and masses of buds were pushing up. It is not so much the quantity of the flowers as their immense size which excited surprise and admiration. The largest flowers noted were of Farquhar. This variety seems quite distinct from any other I am acquainted with, in flower, foliage and in general habit. Mr. McKay says he can easily pick out any stray plants of Farquhar among those of Marie Louise and Lady H. Campbell at the first glance. Other varieties splendidly grown are Swanley White, Marie Louise, Lady H. Campbell, California and the old Czar. Plants in cold frames were equally as thrifty here as those grown indoors. A frame of Violets here received the first prize by the Massachusetts Horticultural Society last spring in the competition for the best house or frame of Violets. A house of hybrid Perpetual Roses, planted out in solid beds, were pushing stout growths. Flowers from this house have surpassed all others at the Boston Spring Show for two seasons past. Mr. McKay has an interesting collection of Orchids, all of which looked thrifty. Some good plants of Dendrobium nobile (Sander's variety), D. Wardianum and D. formosum giganteum were in flower. A batch of Cauliflower, Early Erfurt, in eight-inch pots, were producing good heads ready for cutting.

Mr. William Nicholson, of Framingham, is one of the most successful all-round cultivators of Carnations in Massachusetts. Two large structures and two small ones are devoted to these plants. This season they are looking better even than in previous years, and they have always looked well heretofore. Many varieties are grown, and all were equally vigorous and were flowering freely. Eldorado, William Scott, Daybreak, Minnie Cook, Alaska, F. Mangold, Hector, Thomas Cartledge, Nicholson, Edith Foster and Della Fox were notably good; the last named is not liked as generally as Daybreak. Edith Foster, white, is popular, and Eldorado blooms as freely here as William Scott. A bench of white Antirrhinums suggested the value of this flower for cutting. A fine collection of flowering Begonias was an attraction here. These are specially pleasing at this season. A house, 100 by 15 feet, filled with Tomatoes planted after Chrysanthemums were cut, was setting a heavy crop, Eclipse being the kind most largely grown.

Taunton, Mass. *W. N. Craig.*

Recent Publications.

The Forcing Book. By L. H. Bailey. Macmillan Co., New York.

Ten years ago one could find forced Radishes, Lettuce and occasionally Cauliflower in small quantities in the New York winter markets, but there was nothing like a regular supply of them, and, indeed, there was hardly any demand for them. The business of growing vegetables under glass has since then developed more rapidly than any other branch of horticulture in this country, and this little manual, which belongs to the useful Garden Craft Series, has been prepared to set forth the principles and explain the details of its practice. Since plants in glass houses are entirely under artificial conditions their cultivation demands special skill and the most watchful care. Novices therefore need instruction from the beginning, and Professor Bailey, who has given personal attention to experiments in growing vegetables in connection with his horticultural work in the University and in the experiment station, has qualified himself as a teacher by making practical tests of various methods. The work properly begins with a brief treatise on the construction and management of forcing-houses, for, since the grower must make his own climate as well as his soil, it is quite as essential that he should be able at will to create and command these conditions as it is that he should know exactly what the conditions are which each crop needs. The discussion of the various forms of houses, with their structural details, is very complete, although concise, and for the space it takes it gives more valuable information than can be found elsewhere in the same compass. All such practical questions as would be treated under the head of soil, fertilizers, irrigation, shading, pollination, etc., have received careful study, and the beginner can feel safe in following them to the letter. The book is written primarily for those who intend to take up the winter growing of vegetables as a business, but there are few gardeners with a glass house at command who can resist the challenge to try their skill at raising a melon for Christmas dessert, and few persons who do not enjoy the occasional luxury of a dish of fresh asparagus or tomatoes out of season.

The book is thoroughly up to date, and contains not only a selection of the most approved varieties of each crop for forcing in this country, but it presents the results of the most recent studies in cultural practice and summarizes the results of such instructive investigations as those of Professor Galloway in reference to the mechanical properties of soil essential to the production of the best Lettuce; Professor Munson's experiments in pollinating Tomatoes at the Maine Station; the Connecticut experiments with chemical fertilizers in artificial soil; the tests with electric light in Cornell, West Virginia and elsewhere; Green's plan of subirrigation, or watering by means of underground tiles, and many other practices and processes which have been explained from time to time in this journal.

The manual makes a handy volume of 260 pages, helpfully illustrated and carefully indexed.

Notes.

Lilium auratum is grown to its highest perfection by Mr. G. F. Wilson at his home near Weybridge, Surrey, England. A single stem sometimes carries as many as sixty flowers in a great pyramid whose summit is six and a half feet high.

Since October 1st 622,324 barrels of domestic potatoes have passed through the New York market, somewhat more than two-thirds the quantity handled in the corresponding period a year ago. The receipts of the home crop during last week amounted to 31,314 barrels, besides 1,800 sacks from Great Britain, 200 sacks from Germany and 566 barrels from Bermuda and the West Indies.

The Board of Trade of California, following the example of the Royal Horticultural Society of England and similar associations in various countries, has appointed a subcommittee to promote the International Horticultural Exhibition in Hamburg, which is to continue from May until October of the present year with one continuous show, and special exhibitions for plants and flowers at the time of their best season.

The immense quantities of fruits consumed in New York city, and forwarded from this centre to other sections of the country, are suggested in the arrival last week on a brig from Porto Cortez of 91,000 cocoanuts. Although this fruit, even in its manufactured form, is but occasionally used in families, and then in small quantities, 1,687,500 cocoanuts have arrived at this port since the first of the year.

The plant, often called the Water Hyacinth, Pontederia crassipes, has been naturalized in some of the rivers of our south Atlantic and Gulf states, and has increased so rapidly that it covers the surface of the water for great distances. In the St. John's River, Florida, and in some of the canals about New Orleans it is difficult for steamers to work their way through this raft of vegetation, and when they do the plants close in behind the boat and occupy the surface completely as before. The obstruction to navigation has become so serious that an

appropriation of $10,000 was made last week by the Senate of the United States to enable the Secretary of War to study means of freeing our watercourses from this nuisance.

Steam has shortened the time of ocean transit to such a degree that the perishable fruit on street-stands of almost any city in the world may have come from a remote part of another continent. Good peaches from South Africa are now on sale in the London markets and command $2.50 for a box containing twenty. The first installment of the apple crop from Tasmania will reach London about April 20th, and shipments will arrive regularly every week until July. About 100,000 cases are expected.

Mr. C. L. Allen has a good word to say for the old Madagascar Periwinkle as one of the most pleasing of plants which can be used for bedding, since it can be had covered from June until frost with flowers which are admirably set off by glossy green foliage. If seeds are sown now they will produce plants that will be of flowering size in June, and the seedlings will come true to the type of flower, whether pure white, rose-colored, or white with a crimson eye. If the old plants are taken up at the approach of frost and stored in boxes of sand in a warm cellar and left so dry that growth will not be encouraged they will keep well, and if the stems are cut back at the approach of warm weather they will make much stronger plants the next season and will flower earlier than those grown from seed.

The North Carolina Experiment Station has had prepared a bulletin entitled "The Home Vegetable Garden," by Professor F. W. Massey, to which a short supplement on Pests of the Garden has been added by Gerald McCarthy, the botanist of the station. Altogether, this little bulletin makes up a pamphlet of some fifty pages, which is an excellent handbook for the cultivation of vegetables for home use, not only for the latitude of North Carolina, but for a large part of the country. Besides giving a selection of the different varieties of plants, the book contains some first-rate rules for the best methods of selecting, laying out and enclosing a garden, of making and using cold frames and hot-beds, of preparing and enriching the soil and much other information which a novice ought to be grateful to have placed within his reach.

Mabel Morrison is a Rose that is not often forced, but a few blooms of it in the window of William H. Brower & Sons, on Broadway, near Twenty-third Street, a few days ago showed to good advantage among other brighter blossoms. It lacks the substance of Baroness Rothschild, from which it is a sport, and it is not so full as the flower of the parent plant, but for this very reason it is more delicate, and its pure or flesh-white cup-shaped flowers have a peculiar grace. The foliage is a singularly bright and cheerful green. In the same window was a specimen Acacia cultriformis. Its spikes of flowers, near the end of the branches, stand out in large numbers, making a thyrse-like mass of deep yellow in beautiful contrast with the silvery foliage. These glaucous leaves along the stem resemble scales, and are set on in the peculiar edgewise fashion which gives the plant a marked appearance.

Mr. George H. Hazzard, Commissioner of the Interstate Park of the Dalles of the St. Croix, has submitted his first report to the Governor, and with it a pamphlet of a hundred pages containing much useful matter about this most interesting state reservation. When the park is extended so as to include the lower Dalles, as it in all probability will be, it will extend along three and a half miles of shore-line on the St. Croix. The tract is unique in the variety of its geological features, rich in forms of plant-life, and its scenery is remarkable for wild and picturesque features. In speaking of the advantages of public recreation-grounds for people in the country as well as in the city, the Superintendent states that a Grange in Ohio has recently bought a tract of woodland on the banks of a beautiful stream for a park, while a few miles above The Dalles, on Wolf Creek, the farmers have bought a fine grove where they have erected some shelters and other conveniences for holding Fourth of July celebrations, harvest homes and picnics.

Glacé fruits are among the most attractive and satisfactory of the varied offerings of first-class fruit stores. They come from France in paper boxes, each containing a quarter, a half, or a full pound of inviting preparations, and also in one, two, four and six pound wooden boxes. Some of the larger packages are filled with only one kind of fruit, but these and the smaller ones, with assorted fruits neatly arranged in rows of one kind, are beautiful and make easy buyers of inspecting customers. A two-pound box, for example, holds nearly four dozen fruits in seven rows separated by dainty white lace paper. There are small white pears, tiny limes, alternating yellow and green, large apricots, deep and rich in color, green gages, a showy line of rose-colored pears, one of delicious-looking figs, and by way of novelty and variety, English walnuts, thickly encased in a candied covering. Other combinations are made from meaty cherries, with sweet Bigarreau and the sour fruit to choose from, some arranged with straw stems for convenient handling; peaches, fresh-looking slices of pineapple, some white and others a wholesome rose-color from being dipped in natural fruit-syrup; red and white strawberries; melons, the seeds removed and the whole form retained; mirabelles, small yellow plums; young green almonds, prepared with the outer and inner shell, the kernel being hardly formed, and slices of oranges. The colors, which are very distinct, make striking contrasts. These colors are always the natural tints of the fruits themselves, or in some instances of the bright juices of other fruits. Limes, which come green and yellow, are the unripe and the ripened fruits. The prices range from fifty to eighty cents a pound. Turkish fig-paste—some white and some pink—is a generally esteemed fruit confection, and apricot paste is more rarely seen. In another class are the candied orange, lemon and Sicily citron, seen in grocers' stocks, and glacé Angelique, or stalks of rhubarb, which are used in confectionery. For several years past a high grade of glacé fruits from California have been sold in eastern cities, including figs, plums, cherries and other sorts. Crystallized ginger is, perhaps, the best known of all these confections, and Brazil nuts and other imported and native nuts are largely used in candied coverings, while fruit bars are popular. Among the most costly delicacies are candied rose petals at $1.50 and violets at $2.50 a pound. Many of the fruits also come crystallized, or with an additional coating of granules of sugar.

As we go to press the announcement is made that President Cleveland has set apart by proclamation thirteen new forest reserves, including altogether an area of more than twenty-one million acres. This, added to the reservations previously established by Presidents Harrison and Cleveland, increases the total area of reserved forest land in the western states and territories to about thirty-nine million acres—that is, the combined area of these reservations, exclusive of the National Parks, is as great as that of the states of Maine, New Hampshire, Vermont, Massachusetts and Rhode Island. The new reserves include all the central portion of the Black Hills of South Dakota, the Big Horn Mountain Range in Wyoming, the Jackson Lake country south of the Yellowstone National Park in Wyoming, all the Rocky Mountains of northern Montana, a valuable forest region in northern Idaho, the principal part of the Bitter Root Mountain region in Montana and Idaho, the Cascade Mountains of northern and of southern Washington, the Olympic Mountain region in north-western Washington, the Sierra summits of California north of the Yosemite National Park, the San Jacinto Mountains in southern California, and the Uintah Mountains in northern Utah. The location and boundaries of these forest lands have been carefully studied by the commission appointed by the National Academy of Sciences, who have made it their aim to include as much as possible of the great bodies of timber that are left on unentered land, and wherever it was practicable to secure the continued existence of the forests on high mountain slopes which protect the sources of streams most useful for irrigation and navigation. Much remains to be done before this magnificent domain is rendered safe from spoliation, but the simple act of setting these forest lands apart is enough to justify the creation of the commission. In our next issue we shall publish with some fullness of detail a description of the reservations, and we only add here that it may be doubted whether any act of President Cleveland's administration will have such a beneficent and far-reaching influence upon the welfare of the country as this series of proclamations. The country is to be congratulated on having a Chief Magistrate who is capable of taking such a broad and statesmanlike view, and the people will be grateful to him for the promptness and decision with which he has acted.